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GEOGRAPHIC SCHOOL BULLETINS

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Dr. Raymond A. Dillon

IT WAS A JOYOUS LIFE THAT WAR CRUSHED IN THE GILBERTS

Until the Japanese in 1941 seized the British-ruled Gilbert Islands, the Gilbertese were ahead of many other Pacific islanders in health and general welfare. Almost three-fourths of them were literate. They owned their own coconut plantations. Tarawa was the site of a hospital staffed with barefoot native nurses in white uniforms. Tabiteuea's people maintained one of the biggest outrigger canoes in the Pacific—96 feet long. After a fishing trip in such a seagoing canoe, the fishermen relaxed and celebrated with the fish dance, which involved singing, hand-clapping, and laughing as well as dancing (above). The once-gay Gilberts are one answer to the question, "Where are the Yanks?" (Bulletin No. 2).

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GEOGRAPHIC SCHOOL BULLETIN

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Originally entered as second-class matter January 27, 1922; re-entered as of April 27, 1943, Post Office, Washington, D. C., under Act of March 3, 1879. Copyright, 1944, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

Estonia, Fair Land of Potatoes and Stone

THE Red Army's drive into Estonia brings Soviet forces back to the northernmost of the three small Baltic States (which include Latvia and Lithuania) that front on the Baltic Sea.

Estonia's northeast "panhandle," bordered by big Peipus Lake to the south, is only about 75 air miles southwest of Leningrad, which before the Red Army's westward drive was within range of German big guns. Narva, a few miles inside the northeast corner of Estonia's panhandle, is on the main railway that leads to Leningrad, as well as on a branch line running south into Latvia and beyond.

Holds Strategic Islands

Estonia is the smallest of the Baltic trio. It has an area of a little more than 18,350 square miles (roughly twice that of Vermont), including the two big islands, Saare and Hiiu, off the west coast. These two islands, guarding the traffic lanes leading from the Baltic Sea into the Gulf of Finland, are considered of prime strategic value. In 1939, under a mutual assistance pact between the Soviet Union and Estonia, they were leased as bases for the use of the Red Army, together with the key port of Paldiski (Baltiski) on the mainland.

As the Germans began piling up European conquests in the spring and summer of 1940, Soviet forces occupied all Estonia. In August, 1940, the small nation joined the Soviet Union as a Constituent Republic, along with Latvia and Lithuania. One year later, Estonia was Russia's last Baltic bastion to fall as the Nazis advanced on the road to Leningrad.

From medieval times, the Estonian headland thrust between the Gulf of Finland and the Baltic Sea was marked as a buffer region, held and fought over by powerful neighbors, German, Swedish, and Russian. In the early 12th century, the Teutonic Knights carried sword and cross to Estonia. Later the German invaders were joined by Danish armies who eventually sold out to the Teutons.

After a few hundred years of intermittent peace, 17th century Estonia again became a battleground for Swedes, Poles, and Russians. Sweden ruled it for nearly a century. Finally, in 1710, partly through efforts of the German nobility and landowners who had managed to retain their holdings through all the struggles, it fell to the Russian Tsars, under whose domination it remained until the Bolshevik Revolution. In 1917-1920, postwar struggles and new national boundaries brought Estonia independence.

Germans Transferred to Reich

Estonian inhabitants returned to Russian control in 1940 numbered an estimated 1,122,000. The figure had been lessened the previous year by about 13,000, when the Nazis transferred Estonia's German-speaking minority, known as the Balts, to Reich-held Poland. One of recent history's many forced migrations, the uprooting of the Balts eliminated nearly all the Germanic element which for some 800 years had been prominent in Estonia's economic and political life.

Estonians are chiefly of Finno-Ugrian stock, unlike the inhabitants of neighboring Latvia and Lithuania, but related to the Finns and Hungarians. It is believed they came originally from the Ural Mountains, between Europe and Asia.

In Estonia they found a land of forests, streams, lakes, and marshes. Low

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N. Nylander

TALLINN'S EARLY EFFORTS AT OUTDOOR ADVERTISING PRODUCED A STEEPLE NEARLY AS HIGH AS THE WASHINGTON MONUMENT

An important seaport in Baltic trade for centuries, Tallinn—now Estonia's capital—early took steps to attract passing ships. The steeple of St. Olaf's was built 470 feet high so that it could be seen by sailors at sea. This old spire is more than four-fifths the height of the Washington Monument. The city's name, from *Tanni Linn* ("Danish Castle"), is a reminder that Danes fortified it in the 11th century. The German organization of the Teutonic Knights bought it from the Danes in 1346, and Germanic elements retained some control until the present war. In the past two decades, Tallinn grew to be a modern port equipped with grain elevators, electric cranes, and refrigeration plants. Icebreakers kept the harbor open to serve Estonia's winter trade (Bulletin No. 1).

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Where Are the Yanks? 2. The Gilbert Islands

(This is the second of a series of articles about the regions where American service men and women are stationed.)

FLY southwest from San Francisco 2,400 miles and land at Pearl Harbor. Refuel and continue for a second 2,400 miles without changing your original direction and you will reach the hard-won Betio landing strip on Tarawa in the Gilbert Islands.

Tarawa, Makin, Abemama, and a baker's dozen other land dots called atolls straddle the Equator (map, next page) in the vast western Pacific just west of the International Date Line where each new day begins.

Stretching 500 miles southeast to northwest, they total only 166 square miles of land—these Gilbert Islands of Great Britain's Gilbert and Ellice Islands Crown Colony. Few but mariners and geographers were aware of them until rampant Japs seized positions there a few days after the Pearl Harbor attack.

Cleared Way for Step to Marshalls

Today Tarawa and Makin are household names. Heroic Yanks, having twice raided Makin in 1942, approached by dawn's early light last November 20 and took the Japs' Gilbert bases. The strongly defended Betio segment of Tarawa was virtually stripped of the remnants of its normal plant and animal life by the man-made holocaust. Epic action by Army, Navy, and especially Marines marked the first break in the rising-sun front of the Empire of the Rising Sun.

Why have the Gilberts proved a key to eastern and southern approaches to Tokyo? Of the 3,500-mile arc of small islands called Micronesia, these are the land spots closest to the territory mandated to Japan by the Treaty of Versailles. From Mili in the Marshalls, 220 miles northwest of Makin in the Gilberts, Japanese mandated islands are scattered like stardust across the Pacific westward for 2,500 miles toward the Philippines and northward toward Japan.

The Gilberts, then, placed Americans in a position to step over to the Marshalls and take new bases that had probably been the Jap take-off points for the Pearl Harbor attack. American bases such as Kwajalein in the Marshalls will lead to the Carolines, then north through the Marianas toward Tokyo, or farther west to the Philippines and the mainland of China.

On Atolls Coconut Is King

How do these Gilbert atolls look? What will Yanks on patrol see when they visit islands where native life continues undisturbed?

Typical atolls, the Gilberts are intermittent ribbons of white coral sand covering the windward (eastern) rim of coral reefs of varied sizes and irregular oval shapes. The coral reef ovals enclose a lagoon. The curving ribbons of sand, never more than a half-mile wide nor more than 15 feet above sea level, are from 3 to 50 miles long. They are crowned full length with graceful coconut palms.

The beauty of the palm-crested crescents of sand beside cobalt-blue lagoons and beneath the brilliant tropical sun enraptured Robert Louis Stevenson, who visited the Gilberts in the course of a South Seas quest for health. Perhaps it put poetry into the soul of Captain John Byron, whose gaze rested on Nukunau in 1765. Earliest recorded white visitor to the Gilberts, he was grandsire of Lord Byron, English poet.

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and flat, it is especially suited to certain kinds of agriculture, despite its northern climate, with snowfall often crowding the harvest season.

About 70 per cent of the modern Estonians make their living by farming and the dairy industry, carried on to a large degree normally through cooperative methods. Before the war considerable butter, eggs, and bacon were exported by cooperative organizations to Estonia's best customers, Britain and Germany.

The chief crops are rye, wheat, barley, oats, flax, and potatoes. There's an old description of Estonia as a "fair land of potatoes and stone." Rock-dotted though it seems, this country normally produces so many potatoes that nearly a ton could be given annually to each inhabitant. When the Germans took over, in the fall of 1941, it was reported they confiscated large stores of the nation's farm supplies.

Forest resources are still abundant in Estonia, and in peacetime provide many articles of export, from boards to matches, furniture to carved toys. Oil shale is important in the national wealth, yielding asphalt, pitch, lubricating and fuel oil, some benzine and gasoline for motor cars and planes.

Estonia has few large cities. Prewar Tallinn, the picturesque seaport capital, held less than 150,000 inhabitants (illustration, inside cover). The next ranking city, the old university town of Tartu, had in 1939 only a few more than 60,000 inhabitants.

NOTE: Estonia is shown on the National Geographic Society's Map of Europe and the Near East. A price list of maps may be obtained from the Society's Washington, D. C., headquarters.

For further information, see "Estonia: At Russia's Baltic Gate," in the *National Geographic Magazine* for December, 1939*; and "Flying Around the Baltic," June, 1938.* (*Issues marked by an asterisk are included in a special list of Magazines available to teachers at 10¢ each in groups of ten.*)

Bulletin No. 1, February 28, 1944.

Herman D. Wetter

WOODEN HOUSES AND COBBLESTONES MAKE MAIN STREET IN ESTONIA

For two centuries under the Tsars, Estonians had to use Russian as their official language. Celebrating independence, the country blossomed out with newspapers, books, and signs in Estonian. Signs along this village street announce that you can buy paints and wallpaper at A. Schenk's, rye flour beyond the arched driveway, timber, stone, and tar in the warehouse (right). Along such quiet streets before the war farmers drove their forward-tilted carts with odd-sized wheels to market potatoes and grain.

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Beachhead South of Rome a Historic Battleground

A NEW type of Italian terrain was revealed to Allied forces fighting on the bitterly contested Anzio-Nettuno beachhead south of Rome. In contrast to the wild and mountain-tumbled battleground where their comrades are pushing ahead farther south, their foothold was gained on flat coastal plains.

Broad, flat plains extend from Rome southeastward for about 70 miles to the port of Terracina. Anzio and Nettuno, 30 miles south of Rome, are about halfway along the shoreline of the plains region.

The District Where Latin Was Born

These stretches of flat lowlands are the coastal shelf of Latium, historic section of central Italy that slopes down westward from the cypress-shaded flanks of the Alban Hills just south of Rome and the Lepine Mountains farther south.

This district, unfamiliar in name, is nevertheless familiar in effect to every American soldier whose schooling exposed him to ancient history or the study of Latin. Latium is the birthplace of Latin. The name of the language comes from the name of the place.

Historically, Latium is the cradle of the vast Roman Empire. This is the territory into which the insignificant hill town of Rome expanded at the beginning of its growth. The Latin tribes of Latium were absorbed into Roman citizenship to build the city's strength. Anzio was the ancient capital of a tribe whose people became Roman citizens in 338 B.C.

The Latin poet Virgil, who knew Latium well, made it the scene of some of the exploits of Aeneas, including the battle in which that doughty veteran of the Trojan wars was killed. Anzio was the deathplace of the ancient hero Coriolanus, the birthplace of Nero and Caligula, the summer resort of Cicero.

Roughly rectangular, with sweeping scalloped shores, Latium's coastal lowlands make a flat strip 4 to 12 miles wide between Rome in the north and Terracina in the south, the sea on the west and the mountains on the east. The northernmost sector, in Rome's neighborhood, is known as the Campagna di Roma (to distinguish it from the larger Campania region farther south around Naples). The southern half consists mainly of the Pontine Marshes (illustration, next page).

Appian Way Cuts Straight Across

Railroads, highways, and canals, unlike the mountain-twisted routes of the interior, stretch almost straight across the plains. Parallel road and railway push inland from Anzio and Nettuno to connect with communications approaching Rome from Naples. Farther east another Rome-bound railway roughly rims the mountain-enclosed plain from Terracina.

Through the lowlands of Latium, to keep in touch with its newly absorbed territory, early Rome pushed the historic Appian Way to Terracina, on the first lap of a course through half of Italy. Parts of the ancient road still serve on the direct route between Rome and Terracina, 8 to 15 miles inland from the coast. It cuts straight through the Pontine Marshes, where its construction was an outstanding Roman triumph over malaria as well as marsh.

The Pontine Marshes, dominating the southern half of the coastal plains, ranked for centuries among the most unhealthful spots in the world.

"One does not live, one dies," was the shepherd's legendary reply when a visitor

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Coconut palms are among the few plants that will grow in the Gilberts sand. But coconuts are enough to support a surprising population. There were 27,000 natives on the islands when war came (illustration, cover)—as many people per square mile as live in fertile and industrial Maryland. The hundred white residents included many missionaries whose fate is unknown.

Gilbert natives are vigorous, healthy, intelligent—an old and successful mixture of black-skinned Melanesians from islands far southwest and light-copper Polynesians from the east. Mild magic, superstitions, and sorcery direct almost every action they take.

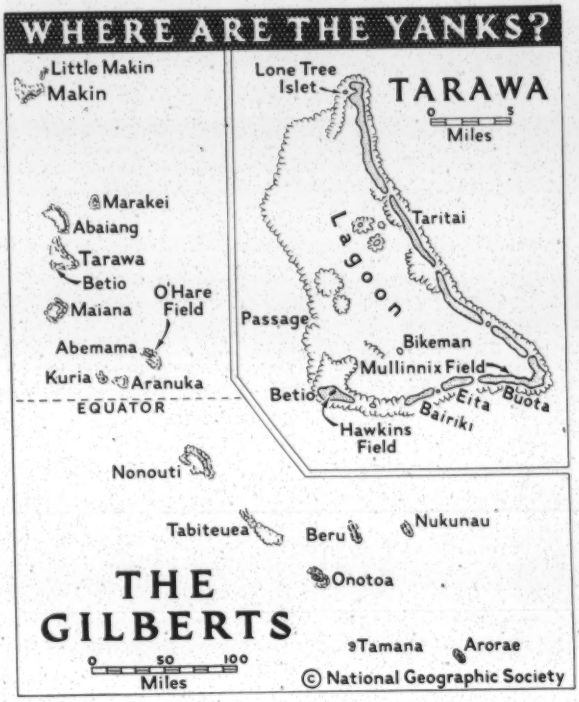
Their ability to cooperate is shown in their method of copra trading. Throughout most of the Pacific, copra—the sun-dried meat of the coconut—is grown and prepared on large plantations, often by imported coolie labor because of native indifference to work for wages. From the Gilberts 4,000 tons of copra are exported in normal years, grown on native-owned plantations, collected and marketed by trading committees.

Crossed Pacific in Canoes

In each Gilbertese village, social life centers in a spacious thatched hall. Combination church, clubhouse, dance hall, and gossip center, it includes space perpetually allotted to visitors from neighboring clans. Natives from other Gilbert Islands, visiting such a community house, are assured a generous and lasting welcome once they have identified themselves satisfactorily.

Living on such small islands remote from the rest of the world, the Gilbertese are natural seamen. Over the centuries they have developed their knowledge of the stars and performed such navigation miracles in their skilfully built, big outrigger canoes as journeys to islands a thousand miles from home.

Their old legends suggest the possibility that they may even have reached the west coast of America.



THE WINDBLOWN GILBERTS ARE WIND-BUILT TOO

All sixteen coral atolls of the Gilberts are lined up like a fleet of ships, turned broadside against the wind. The prevailing equatorial winds washed heavy surf against the atolls' windward side, pulverizing the coral, piling up sand, depositing any drifting matter there to build a patch of dry land. Coconuts floating ashore took root there. Tarawa (inset) is typical: wind- and wave-built dry land islands on the windward side, bare coral reef on the opposite side of the lagoon.

NOTE: The Gilbert Islands are shown in a large-scale inset on the Society's Map of the Pacific Ocean.

See also: "War Finds Its Way to the Gilbert Islands," in the *National Geographic Magazine* for January, 1943; and "Capture of Gilbert Islands Pierces Japan's Eastern Shield," in the GEOGRAPHIC SCHOOL BULLETINS, December 13, 1943.

Bulletin No. 2, February 28, 1944.

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Western Hemisphere Quinine to Replace East Indies Product

QUININE, anti-malaria drug, may again be produced from Western Hemisphere sources. Recent rediscovery in Colombia of what promises to be the world's largest natural stand—700,000 acres of rich quinine-bearing cinchona trees—may mean the reestablishment in the New World of an industry that originally sprang from roots in South America.

The first knowledge of the existence in Colombia of these valuable trees came in 1878. Jose Triana, a young botanist, making a survey of native trees, found and wrote about the "quinine" trees there.

Loss of Far East Source Spurs Search at Home

Both trees and report were forgotten until World War I when the matter was investigated. In 1942, with Far East supplies cut off and synthetics still below top production, the United States and other American republics sought sources in the Western Hemisphere. Guatemala, Ecuador, and Peru were suggested as possibilities. Colombia came under consideration and the Triana report was revived. Botanists sent into the region described by Triana rediscovered the 700,000 acres of trees.

Costa Rica is another American source being studied. A mission of United States experts was sent to that country last year.

Like rubber, quinine traveled from South America to find fame and fortune abroad. The Netherlands Indies island of Java (illustration, next page) produced nine-tenths of the world's supply before Pearl Harbor. Since then, the United States has relied for increased wartime needs of quinine on its stockpile, on synthetics, and on development of sources in Central and South America.

Quinine, principal preventive against and cure for malaria, is extracted from the bark of the cinchona tree. As it takes six years for a newly-planted tree to bear, plantations now being established in South and Central America can be of no immediate help. Only small quantities of the drug come from Colombia, Bolivia, Ecuador, Peru, Brazil, and Venezuela. Triana's miles of trees should be a valuable addition to United Nations' medical supplies for civilian use in hot climates as well as for our fighting men on tropical battlefronts.

Named for Spanish Countess

At the time of Pearl Harbor the U. S. stockpile was 10 million ounces—enough for two or three years. Synthetic substitutes are atabrine, plasmochin, and totaquine; production of these is increasing rapidly. In some respects these chemicals are as effective as quinine.

Centuries ago Indians of Peru chewed bark of the cinchona tree to ward off attacks of fever. Europeans learned of it in the 17th century when the wife of the Count of Chinchón, Spanish viceroy to Peru, was cured of malaria by the powdered bark of this miracle tree. It was named "cinchona" in her honor. Through a typographical error an "h" in her name was lost. In American drug stores of a century ago the "Quinine Sulph." jar was also frequently labelled "Bark Peruv."

Jesuits in Peru sent quinine to be sold in Spain and Italy, where it was known as "Jesuits' bark." By 1800 about 25,000 trees were being killed annually because it was believed necessary to fell the tree to get the bark. By the mid-19th century the cinchona forests of northwest South America were nearly exhausted. The

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asked how he was able to live there.

From ancient times, popes and kings made halfhearted attempts to redeem this malarial marshland by drainage. In 1926 the Italian Government began reclamation work on a large scale. With the help of the Rockefeller Foundation, the malarial scourge was tamed, as bogs and lakes were gradually cleared of stagnant mosquito-breeding water.

Old Roman canals, which at one time had made parts of this area livable and productive, were recut, and new ones were dug. New roads were built. Large farms were put into operation. Colonists were moved in from the heavily populated provinces of northern and central Italy.

Under a combined landowner, government, and peasant-colonist arrangement for operating, financing, and working the big farms, field crops such as wheat, barley, alfalfa, and sugar beets were developed. Vineyards were planted, and the raising of livestock was encouraged.

Note: The regions where Allied forces in Italy are now engaging the Nazis are shown, with ancient as well as modern names, on the Society's Map of Classical Lands of the Mediterranean. See also: "Italy, From Roman Ruins to Radio," in the *National Geographic Magazine*, for March, 1940*; "Redemption of the Pontine Marshes," August, 1934; and "Perennial Geographer," October, 1930*; and in the GEOGRAPHIC SCHOOL BULLETINS: "The Appian Way, an Allied Road to Rome," November 1, 1943.

Bulletin No. 3, February 28, 1944.

IN PONTINE LAGOONS THE FISH MAY COME TO THE FISHERMEN

The coastal lowlands of Italy's Pontine Marshes are walled off from the sea by strings of lofty sand dunes 30 miles long. Before recent drainage projects, water rushing down from the Lepine Mountains to the east was barred from the sea; it accumulated in pools, lagoons, and swamps. Two sand dune formations along the coast enclosed a string of lagoons where fishermen could drop their nets without going to sea. Making a trough through the seaward dune, fishermen spilled a runnel of the lagoon's warm waters into the sea; attracted by this hint of a new source of food, fish swam into the lagoon before the sea closed the break in the dune. The still waters of the lagoon, which mirrored palms and fishing boats, each July became the breeding ground of the anopheles mosquito, carrier of malaria. Since the 4th century B.C. there have been evidences of the disease in the Pontine district. While peasants worked their farms there, they kept up drainage canals. But when the land was concentrated into large estates used chiefly for pastures, drainage was neglected; malaria ruled, and whole towns were abandoned or depopulated by disease.

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Geo-Graphic Brevities

NIKOPOL IS RICH UKRAINE SOURCE OF MANGANESE

NIKOPOL, recaptured in the Russians' drive to free the Ukraine, was well established before German invasion as the center of one of the richest deposits of manganese ore in the world. For this reason it prospered as a mid-point on the U.S.S.R.'s most efficient railroad, which connected Krivoi Rog iron on the west with Donbas coal to the east.

On the right bank of the Dnieper, Nikopol is 50 miles southeast of Krivoi Rog and 45 miles southwest of Zaporozhe. It is 130 miles upstream from the mouth of the river; that is as far as small sea vessels can navigate. Many of the river boats were built in Nikopol shipyards.

The ore deposits along the banks of the Dnieper around Nikopol and Khvochevatka contain forty per cent manganese, essential to steel production. In richness and extent they compare with the Soviet Union's other manganese mining area at Chiaturi in the Georgian S. S. Republic in the Caucasus. These fields and some production in the Ural Mountains combined to give Russia more than two-thirds of world manganese production in prewar years. From the Nikopol deposits alone, over a million tons of ore were taken in 1938—more than the combined output of India and South Africa, which rank second and third respectively in world production. Scientists have estimated the Nikopol manganese reserves at 400 million tons.

In addition to mills producing armor plate, rails, tubes, wire, and steel alloys, Nikopol was a milling center for Ukraine grains transported on the Dnieper.

Note: Nikopol is shown on the Society's Map of Europe and the Near East.

For additional information, see "I Learn About the Russians," in the *National Geographic Magazine* for November, 1943; "'Magnetic City,' Core of Valiant Russia's Industrial Might," May, 1943; "Mother Volga Defends Her Own," December, 1942; and these GEOGRAPHIC SCHOOL BULLETINS: "Strange Place Names Flare on Russia's Battlefront," February 7, 1944; "Russian Victories Reclaim Industrial Cities," November 15, 1943; "Russian Drive Frees the Rich Ukraine," October 11, 1943; and "The Dnepr Line a Russian Battlefront Again," March 15, 1943.

* * * * *

PAPER IS FIGHTING ON MANY FRONTS

"A SCRAP of paper," held in contempt by the German diplomacy of 1914, is a phrase again filled with fighting words. Waste paper is ammunition in a very real sense; it fights and saves lives when collected and converted.

Paper is a "must" in packaging or construction of 700,000 items needed on foreign fronts (illustration, next page). It is the current concern of newspapers and magazines worried about their dwindling stocks of newsprint. As fewer men are available to cut trees supplying pulpwood for paper-making, stocks decline to the vanishing point. Waste paper, normally turned back to paperboard mills, now figures as a prop to pulpwood resources.

Wartime shortages have drafted paper for many new jobs. Hole left in materials dike by metals called to war is now plugged in part with paper.

Paper bomb rings, bomb fins, and paper parachutes for dropping supplies have become a military fashion. Paper overcoats have been styled for blood plasma containers, medicines, life-raft kits, and food units. Paper packages, specially

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Dutch government then sent Justus Hasskarl to Peru to obtain slips and seeds to plant in the East Indies. The Indians revered the trees and objected to their removal from the country. Hasskarl crossed into Bolivia, introduced himself as an amateur botanist. By bribery he got 400 plants out of the country. Planted in Java in 1854, they thrived there; their descendants now cover 42,000 acres with trees.

Save-the-Tree Methods Are New

The Japanese have tried, with little success, to grow cinchona in Formosa. In the Philippines the trees have flourished.

In some localities, so as not to destroy the tree, the bark is cut off in strips and the scars covered with moss. A quinine plantation has trees at all stages of growth from tiny shoots in seed-beds to mature trees.

Quinine combats enemies other than malaria—colds and influenza. It is used in hair tonics and in bitters for flavoring beverages.

Note: For further information, see in the GEOGRAPHIC SCHOOL BULLETINS, April 7, 1941: "Strategic Materials: No. 2, Man's Anti-Malaria Ally—Quinine."

Bulletin No. 4, February 28, 1944.

Dee Bredin

JAVANESE WOMEN TAKE THE FIRST STEP IN FIRST AID FOR MALARIA

In the highlands of central Java, where the cinchona tree of South American ancestry has flourished for 90 years, the men fell 10-year-old trees and cut them into foot-long sections convenient for stripping. At this point the women take over. In gaily printed gowns—no sarongs; notice the long sleeves—their gleaming black hair neatly knotted, they sit cross-legged on the ground before a long row of short lengths of branches. They carefully strip off the precious brown bark which will be pulverized on the plantation and shipped out in sacks to be processed into quinine. About 23 million pounds of bark were stripped annually on plantations in Java, which before Japanese invasion was the world's chief source of the world's chief malaria remedy. After extraction from the bark, the medicine reaches drug counters in capsules, tablets, or in combination with other chemicals.

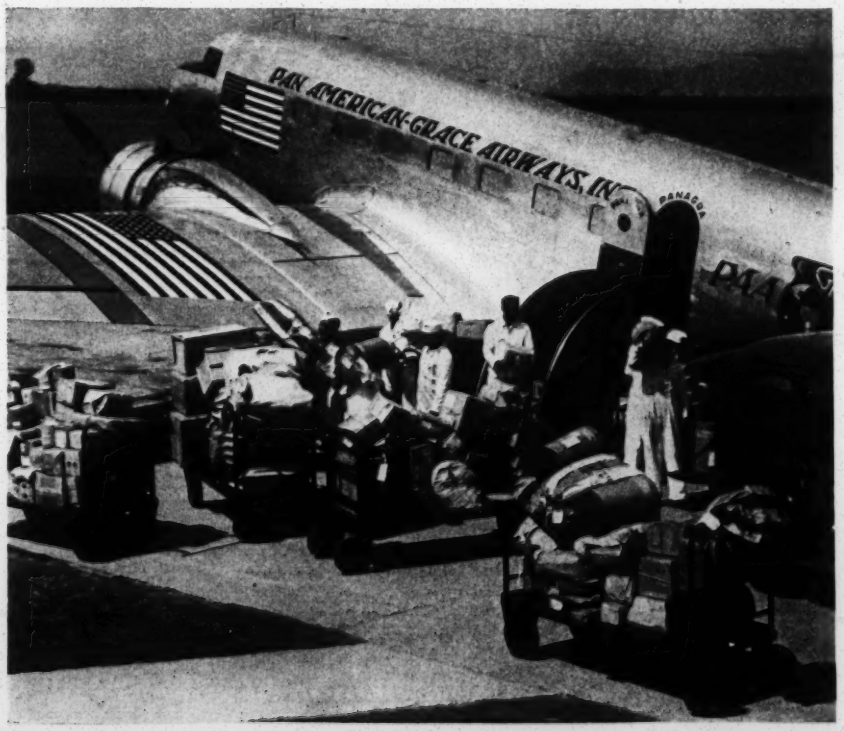
treated, are weatherproof, waterproof, dustproof, germproof. Much ammunition is passed from factory to fronts in paper casings.

Old newspapers pack a robust wallop. One hundred pounds can be processed into 200 containers for blood plasma or for field rations; 50 casings for 75-mm. shells; or 50 V-boxes for food and equipment; 20 protective bands for 200-pound bombs or 11 protective bands for 1,000-pound bombs; or 650 containers for U. S. Army K rations.

Civilians see the shortage in scarcity of paper bags, wrapping paper, in shrinkage of their favorite magazines and newspapers.

War woes beset the paper industry in World War I. Export of wood products heightened paper scarcity in 1916. The Federal Trade Commission took a hand in 1917, said production of paper was "vested with a public interest," and recommended Government control and Canadian cooperation through similar regulation. By the end of 1917 producers and the Government had come to an agreement fixing maximum prices—a "ceiling" ahead of its time.

Bulletin No. 5, February 28, 1944.



PAPER BEHIND THE LINES KEEPS METALS FIGHTING AT THE FRONT

In many forms and on many fronts, at home and overseas, paper is doing double duty for victory. In addition to old home tasks, new ones have been developed. In bags, boxes, and drums, paper is pinchhitting for metals which are urgently needed in actual warfare. From soup cubes to cyanide, many products are changing their traveling costumes to paper containers which lighten loads shipped to far bases. The plane will carry a big cargo in lightweight wartime packagings of cardboard cartons and drums (right), paper wrappings and sacks. Waterproofed by coatings of plastics, paraffin, and other materials, the cylindrical drums substitute for metal containers in which many chemicals once traveled. Cyanide, formerly shipped in steel, and itself an essential in heat treatment of that metal, can now be safely sent in fiber drums. Black powder, used for many military purposes, has changed from steel kegs to waterproof kegs made of pulpwood (a type of paper board). Cotton bags, lined with waterproofed paper, are also used in increasing numbers to transport chemicals.

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